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SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

I, John L. Dennis, residence of Maple Grove, Minnesota, and a Citizen of the United States of America, have invented certain new and useful improvements in:

POUCH WITH FRANGIBLE PIERCING POINT

of which the following is a specification.

TITLE: POUCH WITH FRANGIBLE PIERCING POINT

BACKGROUND

Field

The present invention is directed to a container in the form of a pouch and made of a laminate material. In particular, the present invention relates to a flexible pouch that includes a piercable point.

Description of Related Art

Various types of flexible pouches, also known as flexible beverage containers or stand-up pouches, exist. The containers are convenient for juice and other beverages; in particular, these pouches are often marketed for children's beverages. In addition, larger pouches of this kind are useful for a variety of applications, including storing food, animal feed, liquids, chemicals, and other flowable products.

The above flexible pouch containers often have a basic rectangular shape. The rectangular shape of these containers and pouches normally include side seals on a first and second side, a top seal, and a gusseted bottom member. The stand-up varieties of these pouches are thin at the top and widen towards the base. When the stand-up pouches are filled and placed on a planar surface, the pouches remain in an upright position. Other pouches may not be designed to be stand-up products, but have a similar design, whether with a wide base or a narrow base. In addition, the pouches may include a piercing opening for receiving a straw, or other tool, thus allowing for dispensation of the product contained therein.

Many of the pouches currently available are made from a laminate sheet of material that includes polyester, metal foil, and some sort of sealable plastic film, such as polyethylene. These containers are often heat sealable or sonic-weldable. The pouch material may be made of a foil material that utilizes heat sealing to affix a first panel and a

second panel together, and also to affix a third panel (gusseted) to both the first and second panels.

Additional pouches include an opening created in the laminate and seals affixed to cover the inside and outside of the opening until the opening is pierced by a straw. Such a membrane seal, or seal strip, affixed to the inside of the container may reinforce a pre-punched piercable hole.

Cost is one problem with pouches that add further sealing layers after puncturing or weakening the laminate pouch material, whether as a tab or a strip. Furthermore, adding a small tab that must be pulled back is contrary to creating an "easier" structure for straw insertion. Young children, an important market for pouches of this type, may have a difficult time manipulating a small tab on the front of the pouch.

A further problem with piercable openings created in pouches as described above occurs after the pouch is pierced. That portion of the pouch that has been weakened may be dislodged entirely from the laminate material of the pouch, thereby creating a detached "hole-punch" piece of laminate material. If this hole-punch piece of material is pushed into the container during piercing by the straw, then there is a danger of the hole-punch material being sucked back into the straw. If the hole-punch does not enter the pouch, then it becomes litter, also an undesirable result.

Accordingly, there is need for an improved pouch and method for making a pouch that addresses one or more of the above problems.

SUMMARY

The present invention includes a flexible pouch having a frangible piercing point located on the pouch. The pouch is made with a multi-layer laminate material that is heat sealed or otherwise affixed to form a pouch with a compartment. The frangible piercing point is created by delaminating a portion of the exterior of the laminate, in a defined shape,

in such a manner that the laminate is more easily pierced by a straw. A laser can be used to delaminate the material in a precisely defined pattern.

The present invention includes a pouch comprising a compartment, a multi-layer panel having an interior surface coextensive with the compartment and an external surface. The pouch includes a frangible piercing area disposed on the external surface wherein the frangible piercing area is defined by a continuous arcuate channel created through at least one layer of the multi-layer panel.

A pouch, comprising a compartment formed by an at least one multi-layer laminate panel that include an exterior layer wherein the laminate of the panel includes a frangible piercing point adapted to receive a straw, the frangible piercing point defined by a line of weakness that includes a hinge portion whereby when the frangible piercing point is pierced, the frangible piercing point remains coupled to the laminate material.

A container for juice, the container comprising a compartment formed by operably sealing together a first panel and a second panel, the first panel and the second panel formed from a multi-layer metal foil laminate that includes an exterior layer, the compartment containing the juice. The container further including a frangible piercing point adapted to receive a straw, the frangible piercing point defined by a line of weakness including a hinge portion, whereby when the frangible piercing point is pierced, the line of weakness formed from a delaminated strip of the exterior portion of the multi-layer laminate material of the first panel.

A method of forming a pouch, the method comprising supplying a flexible multi-layer sealable laminate material having an exterior layer, applying laser energy to the exterior plastic layer in a strip to form a desired shape, the shape including one section that is not delaminated and wherein the shape defines a frangible piercing point, cutting the flexible

multi-layer laminate material into panels, and forming the panels into a pouch, wherein the frangible piercing point is situated on an exterior portion of the pouch in a desired position.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of a flexible pouch of the present invention.

FIG. 2 shows a cross-sectional view of the flexible pouch of the present invention along the line A-A.

FIG. 3 is a perspective view of a sheet of laminate material utilized to make the pouch, the laminate material having piercing points in a pattern thereon. FIG. 4 shows a cross-sectional view along the line A-A with a straw inserted through the piercing point.

FIG. 5 shows a front view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 6 shows a perspective view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 7 shows a perspective view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 8 shows a perspective view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 9 shows a perspective view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 10 shows a perspective view of an alternative embodiment of the flexible pouch of the present invention.

FIG. 11 shows a flow chart of the process of making the pouch of FIG. 1.

DETAILED DESCRIPTION

Referring to FIG. 1, a pouch 10 may be filled with liquids, such as juice or water, or may be filled with paste-like materials, fine granular materials, or any other material that may be provided in a flexible container. In one embodiment, the material that the pouch 10 is made of includes one or more layers of a flexible laminate 17, such as an aluminum sheet covered with a plastic material. The laminate 17 may be sealed together by heat sealing, heat welding, ultrasonic sealing or other methods known in the art, such as adhesives and crimping.

As illustrated in FIG. 1, the flexible pouch 10 comprises a first panel 12, a second panel 14, and a third panel 16. The first panel 12, which forms the front side of the pouch 10, is affixed to the second panel 14, which forms the back side of the pouch 10, by a seal along a top edge, 18, a first side 20, and a second side 22. The first panel 12 and the second panel 14 are further affixed to the third panel 16, so that the third panel 16 forms a gusseted bottom between the first panel 12 and the second panel 14. When the panels 12, 14, 16 are affixed together, a pouch 10 is formed. The pouch 10 further comprises a compartment 11 that contains the beverage or other product. Such a pouch may be approximately 6 inches tall, 4.0 inches wide, and a few inches thick at the base (narrowing at the top) though the selected size and dimensions can be varied as described.

The pouch 10 further includes a piercing point 24. In one embodiment the piercing point 24 is located on the first panel 12 near the top edge 18. In alternative embodiments, the piercing point 24 may be located higher, lower, or at any other portion of the first panel 12. In addition, in an alternative embodiment, the piercing point 24 may be located on the second panel 14 or third panel 16. The piercing point 24 is designed to be pierced by a straw 26. The straw 26 is a straight or shaped straw 26 that may be attached to the pouch 10 for use in piercing the piercing point 24 and removing the contents of the compartment 11. The straw

26 is made of plastic and is attached in such a manner as to be easily removed before the pouch 10 is pierced. In alternative embodiments, the piercing point 24 can be positioned at any point on the pouch 10.

As illustrated in FIG. 2, the laminate material 17 includes layers, from the outside to the inside, of polyester 28, adhesive 30, foil 32, adhesive 34, and polyethylene 36. Other materials may also be incorporated into the laminate 17 as desired. For example, the laminate material 17 may further includes an ink layer 38. The ink layer 38 may be positioned between the polyester layer 28 and adhesive layer 30. In one embodiment, the laminate 17 includes a 58 gauge reverse printed material, laminated to a foil (25 to 40 gauge), laminated to a 2.5 to 3.5 mil clear polyethylene sealant film. Other embodiments can utilize other types of laminate 17 as desired.

Referring to FIGS. 1-4, the piercing point 24 of pouch 10 will be further described. As illustrated in FIGS. 1 and 2, the piercing point 24 is defined by a strip 40 where the laminate 17 of the pouch 10 is delaminated. The strip 40 is created by focusing a laser 44 from a laser unit 19 at the laminate material 17 to burn away layers 28, 30, and 38 that are on the exterior of the foil 32. As illustrated in FIG. 3, the laser 44 may be applied to the laminate 17 before the laminate is cut into panels and formed into the pouch 10. The strip 40 may be thicker or more narrow depending on the design of the pouch 10.

The laser 44 contacts the panel 12 and vaporizes the polyester layer 28 as well as the adjacent adhesive layer 30 and ink layer 38. In the present embodiment, the laser unit 19 is a single beam refracted laser. The wattage of the laser unit 19 can vary between about 150 to about 450 watts. The shape of the completed piercing point 24 is formed by controlling the point of the contact between the energy of the laser 44 and the surface of the laminate material 17 using a laser control system.

The power of the laser unit 19 and the path of the beam can be adjusted to produce the correct amount of energy to remove only the desired layers. For example, in the present embodiment, just the polyester layer 28, adhesive 30 layers, and ink layer 38 are removed without removing or damaging the metal foil 32 layer. As may be appreciated, the power of the laser unit 19 may be varied according to what materials are present in the laminate, and to what depth the user decides to vaporize the material. The shape of the strip 40 may be any desired by the user, but as illustrated in FIGS. 1 and 5, the shape is a circle. In another embodiment, illustrated in FIG. 6, the shape of the strip 40 may be a teardrop shape. FIGS. 7-9 illustrate a few alternative piercing point 24 shapes that may be formed by utilization of the laser 44 to delaminate the laminate 17 of the pouch 10. FIG. 7 illustrates a pouch 10 with a U shape piercing point 24. FIG. 8 shows a pouch 10 with a V shape piercing point 24. FIG. 9 illustrates a pouch with an X shape piercing point 24. Other shapes may be utilized without changing the present invention.

As illustrated in FIGS. 5 and 6, the strip 40 may form a shape that is not complete, i.e., a section of the shape of the piercing point 24 is not vaporized. In other words, the strip 40 is not contiguous around a given area but instead includes a hinge 42, the hinge 42 being a gap in the pattern formed by the laser 44. As illustrated in FIGS. 5-6, some portion of the area of the piercing point 24 is left intact and remains attached to the panel 12. As illustrated in FIG. 4, when the piercing point 24 is pierced with a straw 26, the piercing point 24 is not completely separated from the first panel 12 of the pouch. Instead, the piercing point 24 remains attached to the first panel 12 because the laminate 17 folds along the hinge 42 to remain connected to the panel 12. In this manner, the likelihood that the piercing point 24 will be completely detached from the first panel 12 of the pouch 10 is greatly reduced. The piercing point 24 therefore will not end up floating free in the pouch 10 or will not end up as litter.

As illustrated in FIG. 11, to make pouch 10, the laminate 17 is provided (50) as a sheet of material (as illustrated in FIG. 3). The laminate 17 may already have the graphics of the final pouch imprinted thereon. The application of the laser 44 to the laminate 17 may occur before the laminate 17 is cut into panels 12, 14, and 16. As may be appreciated, the piercing point 24 may be placed (52) at any point on the pouch 10 so the application of the laser 44 is not limited to that portion of the laminate sheet that becomes the first panel 12.

Because the laser 44 is applied while the laminate material 17 is an uncut sheet, and before the sheet has been made into panels 12, 14, and 16, a number of frangible piercing points 24 can be consistently and effectively created (52) in a desired pattern on the material (See FIG. 3). After the application of the laser 44 to the laminate 17 material to create the strip 40, the laminate 17 is cut (54) and formed (56) into a pouch 10 in such a manner that the piercing point 24 resides in substantially the same position on each pouch 10. After the pouch 10 is filled (58), the pouch 10 is sealed (60) along the top 18 and the straw 26 is affixed (62) thereto.

In one alternative embodiment, the foil layer 32 is made of a material, or is colored in such a manner, that the contrasting color of the exposed foil 32 at the base of the strip 40 is visible to the user. The exposed color accentuates the shape and placement of the piercing point as formed by the strip.

In another embodiment, the pouch 10 includes a piercing point 24 wherein the piercing point is created by delaminating an entire cross sectional area of the exterior of the laminate 17. As illustrated in FIG. 10, the laser 44 may be used to remove the polyester layer 28, adhesive layers 30, and ink layer 38, such that all of the laminate 17 inside of the pattern of desired shape is delaminated.

The pouch 10 has been described as a stand-up container that may rest in a substantially upright position when set on a surface. In further embodiments, however, the

pouch 10 may not be a stand-up pouch. The first panel 12 and the second panel 14 may be sealed together at the bottom without a third panel between the two. In this manner a pouch 10 may be formed that is narrow at both ends and is designed to lie flat on a surface.

In alternative embodiments a suitable tool other than a straw 26 may be used to pierce the piercing point 24. The tool would then be removed and the contents of the pouch discharged through the opening.

The embodiments described herein are for illustrative purposes and are not meant to exclude any derivations or alternative methods that are within the conceptual context of the invention. It is contemplated that various deviations can be made to the described embodiments without deviating from the scope of the present invention. Accordingly, it is intended that the scope of the present invention be dictated by the appended claims rather than by the foregoing description of this embodiment.